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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,870	06/27/2003	Kentin L. Alford	BA4-158	7089

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EXAMINER

JOLLEY, KIRSTEN

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/607,870

Applicant(s)

ALFORD ET AL.

Examiner

Kirsten C. Jolley

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-56 is/are pending in the application.
- 4a) Of the above claim(s) 9-13, 19-29 and 40-56 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 14-18 and 30-39 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 8/6/03, 8/11/03, 1/26/04, 2/22/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Election/Restriction

1. This application contains claims directed to the following patentably distinct species: a substrate of glass, aluminum (including aluminum oxide surface), silicon wafer (including silicon oxide surface), carbon, silicon carbide, titanium (including titanium oxide surface), or porous material. The species are independent or distinct because they are mutually exclusive.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, claims 1-6 and 14-18 are generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

2. During a telephone conversation with David Latwesen on August 25, 2004 a provisional election was made with traverse to prosecute the invention of glass substrate as the elected species, claims 1-8, 14-18, and 30-39. Affirmation of this election must be made by applicant in

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replying to this Office action. Claims 9-13, 19-29, and 40-56 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Specification

4. The disclosure is objected to because of the following informalities: The second paragraph of the specification should be updated to indicate the status (patent number or abandonment) of the parent applications.

Appropriate correction is required.

Priority

5. It is noted that claims 1, 3-8, 14-18, 30, and 32-39 of the instant application are given a priority date of June 27, 2003, the filing date of the instant application, since the parent applications do not disclose the newly-added disclosure of use of "a pressure of at least 30 psi". Claims 2 and 31 have been given a priority date of March 19, 1999 since the parent applications disclose exposing the surface to the precursor molecules in a supercritical fluid, which necessarily exposes the surface to the precursor molecules under a pressure of at least 30 psi.

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the “right to exclude” granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1-8, 14-18, and 30-39 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-7 of U.S. Patent No. 6,753,038. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant claims are broader than and thus inclusive of the claims of U.S. Patent No. 6,753,038 since exposing the self-assembled monolayer to supercritical fluid necessarily meets the limitation of exposing under a pressure of at least 30 psi. Further, it would have been obvious to have used a precursor comprising functionalized silicon and an oxygen-containing substrate (including glass) since such are well known SAM precursors and substrates in the SAM art.

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8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 1, 3-4, 7, 14-18, 30, 32-35, and 38 are rejected under 35 U.S.C. 102(e) as being anticipated by Fukushima et al. (US 2002/0197879).

Fukushima et al. discloses a method of forming a monolayer of functionalized silicon on a substrate surface, the functionalized silicon including an organic group covalently attached with the silicon, the method comprising exposing the substrate surface to a silane precursor using compressed carbon dioxide as a solvent under a pressure of 1500 psi in Example 3, the precursor interacting with the substrate to form the monolayer across at least a portion of the surface of the substrate.

As to claims 7, 30, and 38, Fukushima et al. teaches that the substrate may be glass in paragraph 0020, which has an oxygen-containing surface. Further, with respect to independent claim 30, Fukushima et al. teaches use of a ITO coated glass which has an oxygen-containing surface in Example 3.

As to claims 14-15 and 33, Fukushima et al. teaches a film of water across a surface of the substrate and chlorosilane precursor in paragraph 0044.

As to claims 16-18, Fukushima et al. teaches exposing the substrate to the precursor molecules for a time of two hours, which meets the claimed limitations.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 5-6, 8, 36-37, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fukushima et al.

As to claims 5-6, Fukushima et al. teaches an exemplary pressure of 1500 psi in Example 3. However Fukushima et al. states "the pressure and/or temperature of the compressed carbon dioxide is/are selectively controlled so as to enhance the density of the self-assembled monolayer on the substrate" (paragraph 0016). Therefore Fukushima et al. teaches that the pressure would be optimized through routine experimentation. It is well settled that determination of optimum values of cause effective variables such as these process parameters is within the skill of one practicing in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

As to claim 8, Fukushima et al. teaches that the substrate may be glass. Fukushima et al. lacks a teaching that the substrate comprises glass fiber, and the incorporation of glass fiber into a fiberglass matrix. It would have been obvious to have performed the process of Fukushima et al. on a glass fiber substrate and incorporated the glass fiber into a fiberglass matrix with the expectation of successful results since it is known to incorporate coated glass fibers into a fiberglass matrix.

Allowable Subject Matter

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12. Claims 2 and 31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 2 and 31 are allowable over the prior art because the prior art does not teach or fairly suggest exposing the substrate surface to the precursor molecules in a supercritical fluid.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cao and McCarthy's "Formation of Trialkyl Silyl Monolayers on Si(100) Using Organosilanes in Carbon Dioxide" is cited for its similar teaching of using carbon dioxide under pressure of 950 psi to deposit a monolayer on a silicon wafer surface.

Enick et al. (US 6,183,815) is cited for its teaching of coating a metal surface with a monolayer comprising exposing the substrate surface to a thiol-containing precursor under pressure using liquid carbon dioxide as the solvent (col. 3, lines 63-67).

Yang et al. (US 6,716,378) is cited for its teaching of using pressure of 100,000-200,000 Pa (14.5-29 psi) to form a monolayer on at least a portion of the substrate.


Maracas et al. (US 5,669,303) is cited for its teaching of using pressure to form a self-assembled monolayer on at least a portion of the substrate.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C. Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Wednesday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Kirsten C Jolley
Primary Examiner
Art Unit 1762

kcj